MP0086 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appeal No. _______________

Application No.:	09/991,043
Filing Date:	November 21, 2001
Appellant:	William Lo
Conf. No.:	
Group Art Unit:	2142
Examiner:	Douglas B. Blair
Title:	APPARATUS AND METHOD FOR AUTOMATIC SPEED DOWNSHIFT FOR A TWO PAIR CABLE

REPLACEMENT BRIEF ON APPEAL ON BEHALF OF APPELLANT

Mail Stop Appeal Brief-Patents
P.O. Box 1450
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February 9, 2009

Sir:

This appeal is from the decision of the Patent Examiner dated June 14, 2007, rejecting claims 1-131, 134-137, 140, 141, and 156-182 and in response to the Notice of Non-Compliant Appeal Brief mailed January 9, 2009.

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BRIEF ON APPEAL ON BEHALF OF APPELLANT

In support of the Notice of Appeal filed September 14, 2007, appealing the Examiner's Rejection of claims 1-131 and 156-182, mailed June 14, 2007, which appear in the attached Appendix A, Appellant hereby provides the following remarks.

I. REAL PARTY IN INTEREST

The present application is assigned to Marvell International Ltd. as recorded in the Patent and Trademark Office at Reel 012329, Frame 0476 and Reel 012330, Frame 0210.

II. RELATED APPEALS AND INTERFERENCES

The undersigned, the Assignee, and the Appellant do not know of any other appeals or interferences which would directly affect or that would be directly affected by, or have a bearing on, the Board's decision in this Appeal.

III. STATUS OF THE CLAIMS

Claims 1-131 and 156-182 are rejected. Each of these claims is currently pending in the application.

Claims 1-131 and 156-182 are the claims on Appeal and are reproduced in the attached Appendix A.

Claims 132-155 are cancelled and are not involved with this Appeal.

IV. STATUS OF THE AMENDMENTS

An amendment filed herewith on February 9, 2009 cancels claims 132-155.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 recites a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable (FIG. 3, element 54; Page 8, Lines 7-9). An autonegotiation controller communicates with said DSP (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and includes a cable detector (FIG. 4, element 60; Page 8, Lines 9-10) that determines a first number of pairs of twisted pair wires of said cable that are operable (Page 8, Lines 14-17).

Independent claim 25 recites a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising cable including at least two pairs of twisted pair wires (FIGS. 1 and 2, elements 18 and 20; Page 1, Lines 10-12 and Page 2, Lines 11-14). A digital signal processor (DSP) coupled to said cable receives and decodes first signals on said cable and codes and transmits second signals on said cable (FIG. 3, element 54; Page 8, Lines 7-9). An autonegotiation controller communicates with said DSP (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and includes a cable detector (FIG. 4, element 60; Page 8, Lines 9-10) that determines a first number of pairs of twisted pair wires of said cable that are operable (Page 8, Lines 14-17) and a speed adjuster that masks an advertised speed of said first device when said cable detector determines that said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device (FIG. 4, element 64; Page 8, Lines 15-20).

Independent claim 34 recites a method for operating a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising coupling a digital signal processor (DSP) to said cable (FIG. 3, element 54; Page 8, Lines 7-9), receiving and decoding first signals on said cable, coding and transmitting second signals on said cable, communicating with said DSP using an autonegotiation controller (FIGS. 3 and 4, element 52; Page 8, Lines 7-9), and detecting a first number of pairs of twisted pair wires of said cable that are operable with

a cable detector (FIG. 4, element 60; Page 8, Lines 9-10) associated with said autonegotiation controller.

Independent claim 58 recites a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising signal processing means coupled to said cable for receiving and decoding first signals on said cable and for coding and transmitting second signals on said cable (FIG. 3, element 54; Page 8, Lines 7-9), and autonegotiation means for communicating with said signal processing means (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and including cable detector means (FIG. 4, element 60; Page 8, Lines 9-10) for determining a first number of pairs of twisted pair wires of said cable that are operable (Page 8, Lines 14-17).

Independent claim 82 recites an Ethernet network comprising a first network device with a first physical layer (FIG. 3, element 50; Page 8, Lines 7-9) including a first digital signal processor (DSP) coupled to cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable (FIG. 3, element 54; Page 8, Lines 7-9), and a first autonegotiation controller that communicates with said first DSP (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and that includes a first cable detector (FIG. 4, element 60; Page 8, Lines 9-10) that determines a first number of pairs of twisted pair wires of said cable that are operable (Page 8, Lines 14-17). A second network device (FIGS. 1 and 2, element 12; Page 1, Lines 10-12) with a second physical layer (FIGS. 1 and 2, element 14-2; Page 1, Lines 10-12) including a second DSP coupled to said cable receives and decodes said second signals on said cable and codes and transmits said first signals on said cable.

Independent claim 107 recites a network device that is connected to cable of an Ethernet network, comprising a physical layer (FIG. 3, element 50; Page 8, Lines 7-9) including a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals to said second device on said cable (FIG. 3, element 54; Page 8, Lines 7-9), and an autonegotiation controller that communicates with said DSP (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and that includes a cable detector (FIG. 4, element 60; Page 8, Lines 9-10) that determines a first number of pairs of twisted pair wires of said cable that are operable (Page 8, Lines 14-17).

Independent claim 156 recites a method for operating a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising coupling said cable to a digital signal processor (DSP), receiving and decoding first signals on said cable using said DSP, and coding and transmitting second signals on said cable using said DSP (FIG. 3, element 54; Page 8, Lines 7-9), determining a first number of pairs of twisted pair wires of said cable that are operable (FIG. 4, element 60; Page 8, Lines 9-10 and Lines 14-17), and masking an advertised speed of said first device when said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device (FIG. 4, element 64; Page 8, Lines 15-20 and Page 9, Lines 4-8).

Independent claim 165 recites a software method for operating a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising coupling said cable to a digital signal processor (DSP), receiving and decoding first signals on said cable using said DSP, and coding and transmitting second signals on said cable using said DSP (FIG. 3, element 54; Page 8, Lines 7-9), determining a first number of pairs of twisted pair wires of said cable that are operable (FIG. 4, element 60; Page 8, Lines 9-10 and Lines 14-17), and masking an advertised speed of said first device when said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device (FIG. 4, element 64; Page 8, Lines 15-20 and Page 9, Lines 4-8).

Independent claim 174 recites a physical layer of a first device that is connected to cable of an Ethernet network (FIG. 3, element 50; Page 8, Lines 7-9), comprising signal processing means coupled to said cable for receiving and decoding first signals on said cable and for coding and transmitting second signals on said cable (FIG. 3, element 54; Page 8, Lines 7-9), and autonegotiation control means for communicating with said signal processing means (FIGS. 3 and 4, element 52; Page 8, Lines 7-9) and including cable detection means for determining a first number of pairs of twisted pair wires of said cable that are operable (FIG. 4, element 60; Page 8, Lines 9-10 and Lines 14-17) and speed adjusting means for masking an advertised speed of said first device when said cable detection means determines that said first number is less than a

number of twisted pair wires that are required to support a requested speed of said first device (FIG. 4, element 64; Page 8, Lines 15-20 and Page 9, Lines 4-8).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellant seeks the Board's review of the rejections of:

(a) Claims 1-2, 7-8, 11-24, 34-59, 64-65, 68-84, 89-109, 114-115, 132-133, 138-139, and 142-155 under 35 U.S.C. § 102(e) as being anticipated by Agazzi et al. (U.S. Pat. No. 6,898,185); and

(b) Claims 3-6, 9-10, 25-33, 60-63, 66-67, 85-88, 110-113, 116-131, 134-137, 140-141, and 156-182 under 35 U.S.C. § 103(a) as being unpatentable over Agazzi et al. (U.S. Pat. No. 6,898,185) in view of Trans (U.S. Pat. No. 6,377,640).

VII. ARGUMENTS

A. The Rejections

The rejections that are the subject of this appeal are: a rejection of each of independent claims 1, 34, 58, 82, and 107 under 35 U.S.C. § 102(e) as being anticipated by Agazzi; and a rejection of each of independent claims 25, 156, 165, and 174 and dependent claim 134 under 35 U.S.C. § 103(a) as being unpatentable over Agazzi in view of Trans.

With respect to independent claims 1, 34, 58, 82, and 107, the Examiner alleges that Agazzi teaches physical layer of a first device that is connected to cable of an Ethernet network, comprising: a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable (citing Column 9, Line 33 – Column 10, Lines 35); and an autonegotiation controller that communicates with said DSP and that includes a cable

detector that determines a first number of pairs of twisted pair wires of said cable that are operable (citing Column 19, Lines 25-29 and Column 20, Lines 12-28).[1]

With respect to independent claims 25, 156, 165, and 174 and dependent claim 134, the Examiner alleges that Agazzi teaches physical layer of a first device that is connected to cable of an Ethernet network, comprising: cable including at least two pairs of twisted pair wires (citing Column 9, Line 33 – Column 10, Line 35); a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable (citing Column 9, Line 33 – Column 10, Lines 35); and an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable when said cable detector determines that said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device (citing Column 19, Lines 25-29 and Column 20, Lines 12-28).[2]

The Examiner admits that Agazzi does not explicitly teach a speed adjuster that masks an advertised speed. Instead, the Examner alleges that Trans teaches a physical layer of a first device that is connected to cable of an Ethernet network including a speed adjuster that masks an advertised speed (citing Column 21, Lines 6-41).[3]

B. Claim Distinctions

1. Distinctions regarding independent Claims 1, 34, 58, 82, and 107 with respect to the rejection of Claims 1-2, 7-8, 11-24, 34-59, 64-65, 68-84, 89-109, 114-115, 132-133, 138-139, and 142-155 under 35 U.S.C. § 102(e) as being anticipated by Agazzi et al. (U.S. Pat. No. 6,898,185)

Applicants respectfully submit that the rejection of claims 1-2, 7-8, 11-24, 34-59, 64-65, 68-84, 89-109, 114-115, 132-133, 138-139, and 142-155 under 35 U.S.C. §

[1] See Page 4, Lines 4-9 of the FINAL Office Action mailed June 14, 2007.
[2] See Page 7, Lines 15-23 of the FINAL Office Action mailed June 14, 2007.
[3] See Page 8, Lines 1-2 of the FINAL Office Action mailed June 14, 2007.

102(e) as being anticipated by Agazzi is improper because Agazzi fails to show, teach, or suggest all of the limitations of each of claims 1, 34, 58, 82, and 107.

With respect to claim 1, Agazzi fails to show, teach, or suggest at least a physical layer comprising an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable. In other words, **the autonegotiation controller includes the cable detector that determines the first number of pairs of twisted pair wires that are operable**. In contrast, the cable detector of Agazzi is neither associated with nor included on the alleged autonegotiation controller.

For anticipation to be present under 35 U.S.C §102(b), there must be **no difference** between the claimed invention and the reference disclosure as viewed by one skilled in the field of the invention. Scripps Clinic & Res. Found. V. Genentech, Inc., 18 USPQ.2d 1001 (Fed. Cir. 1991). All of the limitations of the claim must be inherent or expressly disclosed and must be arranged as in the claim. Constant v. Advanced Micro-Devices, Inc., 7 USPQ.2d 1057 (Fed. Cir. 1988). Here, Agazzi fails to disclose the limitation of **an autonegotiation controller that includes a cable detector** that determines a first number of pairs of twisted pair wires of said cable that are operable.

As shown in an exemplary embodiment in FIGS. 3 and 4 of the present application, a physical (PHY) layer 50 of a device includes an autonegotiation controller 52. In turn, the autonegotiation controller includes a cable detector 60. The cable detector 60 determines the number of operable pairs of twisted pair wires provided by a cable 20. In other words, the autonegotiation controller 52 itself includes the cable detector 60 that determines the number of operable pairs of twisted pair wires. (See Paragraphs [0028]-[0029] of the present application). Further, the PHY layer 50 includes the autonegotiation controller 52 and the cable detector 60. Consequently, cable detection is associated with operation speed (i.e. operation speed is dependent upon a number of operable cables) and autonegotiation.

Agazzi fails to explicitly or implicitly disclose this limitation. For example, the Examiner alleges that Agazzi discloses this limitation at Column 19, Lines 25-39 and

Column 20, Lines 12-28. Appellant respectfully notes that neither of these cited portions discloses an **autonegotiation controller** that includes a cable detector.

For example, the first cited portion of Agazzi states:

> The diagnostic report function computes the return loss at step 2950. The return loss is calculated in the same fashion as the cable loss in step 2940. However, the coefficients of echo canceller 232 (FIG. 11) are used. The return loss is reported as a function of frequency and margins versus IEEE limits. The cable length may also be estimated using the reflection from the far-end of the cable, which typically exists as a result of mismatches between the termination impedance and the characteristic impedance of the cable. The delay of this reflection is divided by twice the delay per unit length of the UTP-5 cable, to obtain an independent estimate of the cable length. When the cable is broken at some intermediate point, this function returns as estimate of cable length the distance between the transceiver and the point where the cable is cut.

Appellant notes that the above cited portion is absent of any teaching or suggestion that **an autonegotiation controller** includes a cable detector and instead is generally directed to estimating cable length. Here again, Appellant's claim 1 recites that the autonegotiation controller, specifically, includes the cable detector.

The second cited portion of Agazzi states:

> A flowchart for an exemplary broken pair determination function is shown in FIG. 20. The broken pair determination function queries local transceiver 102 (FIG. 10) and receives transmission energy level detection signals for each of the four twisted pairs within the transmission cable. The broken pair determination function then scans the returned values to see if there is a twisted pair for which no energy is detected at step 3210. The broken pair determination function then determines the distance to the break at step 3220 if there is a pair for which there is no transmission energy. The break distance is estimated using the same technique as in step 2940 (FIG. 17) for calculating cable length; however, the detected reflected signal is because of the break in the line and not because of impedance mismatches caused by normal line termination. The broken pair determination function displays the estimated break distance at step 3230 as well as the broken pair identification.

Here again, the above cited portion appears to be absent of any teaching or suggestion that an autonegotiation controller, specifically, includes a cable detector and instead is generally directed to broken pair determination. Instead, this portion is

generally directed to a broken pair determination without any description whatsoever as to what specific elements are performing the broken pair determination.

Appellant presented the above arguments during a personal interview conducted on February 15, 2007. In response, the Examiner initially contended that this structure would be obvious "based on the lack of details on how such a limitation is implemented as provided by the Appellant's specification." (See Continuation Sheet of the Interview Summary of February 15, 2007). In response, Appellant noted that Agazzi does not expressly or inherently disclose an autonegotiation controller that includes a cable detector as Appellant's claim 1 recites, and that therefore the rejection of the claims under § 102(b) is improper. (See Page 3 of the Response filed March 13, 2007).

The Examiner later contended that Agazzi anticipates the claimed invention because "the Applicant never defines the autonegotiation controller in the Applicant's specification...nor does the Appellant provide any evidence of how the autonegotiation controller is to be interpreted." (See Page 3, Lines 4-8 of the FINAL Office Action mailed June 14, 2007). Appellant respectfully disagrees. As described above with respect to Paragraphs [0028] and [0029] of the present application, and as clearly shown in FIG. 4, **the autonegotiation controller 52 includes the cable detector 60**. This structure is explicitly recited in Appellant's claims. Further, Appellant respectfully asserts that whether the autonegotiation controller is explicitly "defined" in the specification or "evidence of interpretation" is provided is not at all relevant to a rejection under § 102(b). Instead, Appellant respectfully notes that there still must be **no difference** between the claimed invention and the reference disclosure as viewed by one skilled in the field of the invention.

Appellant respectfully submits that there clearly is a difference between the claimed invention and the reference because Agazzi fails to disclose i) a PHY layer that includes an autonegotiation controller, and ii) that the autonegotiation controller includes a cable detector. For example, the Examiner alleges that a PHY control module 1302 of Agazzi "features the autonegotiation module...and the PHY control module performs the claimed diagnostics." (See Page 3, Lines 8-14 of the FINAL Office Action). Appellant respectfully disagrees because the PHY control module 1302, which the Examiner alleges "features the autonegotiation module," **is not an autonegotiation controller**

and does not "feature," or include, an autonegotiation controller. Appellant respectfully notes that FIG. 13 of Agazzi clearly discloses a separate autonegotiation module 1310. As such, the Examiner's position that the PHY control module 1302 is **an autonegotiation controller** that includes a cable detector is improper. The Examiner fails to provide any evidence in support of the allegation that the PHY control module 1302 is, or includes, an autonegotiation controller as claim 1 recites.

Appellant further notes that the Examiner's position that the PHY control module 1302 "performs the claimed diagnostics" is unsupported. The Examiner relies on Column 17, Lines 17-33 of Agazzi, which state that the PHY control module 1302 may be "placed in diagnostics mode." This cited portion fails to disclose that PHY control module 1302, specifically, includes a cable detector. Instead, the Examiner relies on Column 19, Lines 25-39, and Column 20, Lines 12-28 of Agazzi to disclose alleged cable detection. Appellant respectfully notes that neither these nor any other cited portions of Agazzi disclose that the PHY control module 1302 specifically includes the cable detector that performs these functions as claim 1 recites. Appellant further notes that Agazzi fails to disclose that the actual autonegotiation module 1310 includes a cable detector and/or performs cable detection functions, and that the Examiner fails to provide any evidence in support of such a structure in Agazzi.

Appellant further submits that locating the cable detector on the autonegotiation controller is a meaningful distinction over the structure of the prior art. In the present application, the structure of the autonegotiation controller, which includes the cable detector, associates autonegotiation with cable detection. Consequently, an operating speed determined during autonegotiation may be influenced by the number of operable twisted pair wires that are detected.

Appellant respectfully submits that Agazzi fails to show, teach, or suggest an autonegotiation controller that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable. The alleged PHY control module of Agazzi is not an autonegotiation controller, and does not include a cable detector. As such, Appellant respectfully submits that claim 1, as well as its dependent claims, should be allowable for at least the above reasons. Independent claims 34, 58,

82, and 107, as well as their corresponding dependent claims, should be allowable for at least similar reasons.

2. Dependent Claims 2-24, 35-57, 59-81, 83-106, and 108-131

With regard to claims 2-24, 35-57, 59-81, 83-106, and 108-131, these claims are allowable for at least the reasons previously presented with regard to claims 1, 34, 58, 82, and 107, respectively. Accordingly, it is respectfully requested that the rejection of these claims be overturned.

3. Distinctions regarding independent Claims 25, 156, 165, and 174 with respect to the rejection of Claims 3-6, 9-10, 25-33, 60-63, 66-67, 85-88, 110-113, 116-131, 134-137, 140-141, and 156-182 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Agazzi et al. (U.S. Pat. No. 6,898,185) in view of Trans (U.S. Pat. No. 6,377,640).

Claims 3-6, 9-10, 25-33, 60-63, 66-67, 85-88, 110-113, 116-131, 134-137, 140-141, and 156-182 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Agazzi et al. (U.S. Pat. No. 6,898,185) in view of Trans (U.S. Pat. No. 6,377,640) is improper because Agazzi fails to show, teach, or suggest all of the limitations of each of claims 25, 156, 165, and 174.

With respect to claims 25 and 174, Agazzi, either singly or in combination with Trans, fails to show, teach, or suggest at least a physical layer comprising an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable. In other words, **the autonegotiation controller includes the cable detector that determines the first number of pairs of twisted pair wires that are operable**. In contrast, the cable detector of Agazzi is neither associated with nor included on the alleged autonegotiation controller.

Further, with respect to claims 25, 156, 165, and 174, Agazzi, either singly or in combination with Trans, fails to disclose a speed adjuster that masks an advertised speed of a first device when said cable detector determines that said first number is less

than a number of twisted pair wires that are required to support a requested speed of said first device.

It is a longstanding rule that to establish a prima facie case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 143 (CCPA 1974), see MPEP §2143.03. Furthermore, when evaluating claims for obviousness under 35 U.S.C. §103, all of the limitations must be considered and given weight. *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), MPEP § 2144.03. Here, Agazzi fails to disclose the limitation of **an autonegotiation controller that includes a cable detector** that determines a first number of pairs of twisted pair wires of said cable that are operable.

With respect to claims 25 and 174 and as shown in an exemplary embodiment in FIGS. 3 and 4 of the present application, a physical (PHY) layer 50 of a device includes an autonegotiation controller 52. In turn, the autonegotiation controller includes a cable detector 60. The cable detector 60 determines the number of operable pairs of twisted pair wires provided by a cable 20. In other words, the autonegotiation controller 52 itself includes the cable detector 60 that determines the number of operable pairs of twisted pair wires. (See Paragraphs [0028]-[0029] of the present application). Further, the PHY layer 50 includes the autonegotiation controller 52 and the cable detector 60. Consequently, cable detection is associated with operation speed (i.e. operation speed dependent upon operable cables) and autonegotiation.

Agazzi fails to explicitly or implicitly disclose this limitation. For example, the Examiner alleges that Agazzi discloses this limitation at Column 19, Lines 25-39 and Column 20, Lines 12-28. Appellant respectfully notes that neither of these cited portions discloses an **autonegotiation controller** that includes a cable detector.

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> estimate of the cable length. When the cable is broken at some intermediate point, this function returns as estimate of cable length the distance between the transceiver and the point where the cable is cut.

Appellant notes that the above cited portion is absent of any teaching or suggestion that **an autonegotiation controller** includes a cable detector and instead is generally directed to estimating cable length. Here again, Appellant's claim 25 recites that the autonegotiation controller, specifically, includes the cable detector.

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> A flowchart for an exemplary broken pair determination function is shown in FIG. 20. The broken pair determination function queries local transceiver 102 (FIG. 10) and receives transmission energy level detection signals for each of the four twisted pairs within the transmission cable. The broken pair determination function then scans the returned values to see if there is a twisted pair for which no energy is detected at step 3210. The broken pair determination function then determines the distance to the break at step 3220 if there is a pair for which there is no transmission energy. The break distance is estimated using the same technique as in step 2940 (FIG. 17) for calculating cable length; however, the detected reflected signal is because of the break in the line and not because of impedance mismatches caused by normal line termination. The broken pair determination function displays the estimated break distance at step 3230 as well as the broken pair identification.

Here again, the above cited portion appears to be absent of any teaching or suggestion that an autonegotiation controller, specifically, includes a cable detector and instead is generally directed to broken pair determination. Instead, this portion is generally directed to a broken pair determination without any description whatsoever related to what specific elements are performing the broken pair determination.

Appellant presented the above arguments during a personal interview conducted on February 15, 2007. In response, the Examiner initially contended that this structure would be obvious "based on the lack of details on how such a limitation is implemented as provided by the Appellant's specification." (See Continuation Sheet of the Interview Summary of February 15, 2007). In response, Appellant noted that Agazzi does not expressly or inherently disclose an autonegotiation controller that includes a cable detector as Appellant's claim 25 recites, and that therefore the rejection of the claims under § 102(b) is improper. (See Page 3 of the Response filed March 13, 2007).

The Examiner later contended that Agazzi anticipates the claimed invention because "the Applicant never defines the autonegotiation controller in the Applicant's specification...nor does the Appellant provide any evidence of how the autonegotiation controller is to be interpreted." (See Page 3, Lines 4-8 of the FINAL Office Action mailed June 14, 2007). Appellant respectfully disagrees. As described above with respect to Paragraphs [0028] and [0029] of the present application, and as clearly shown in FIG. 4, **the autonegotiation controller 52 includes the cable detector 60**. This structure is explicitly recited in Appellant's claims. Further, Appellant respectfully asserts that whether the autonegotiation controller is explicitly "defined" in the specification or "evidence of interpretation" is provided is not at all relevant to a rejection under § 103(a). Instead, Appellant respectfully notes that the prior art must still teach or suggest all of the claim limitations.

Appellant respectfully submits that there clearly is a difference between the claimed invention and the prior art because Agazzi fails to disclose i) a PHY layer that includes an autonegotiation controller, and ii) that the autonegotiation controller includes a cable detector. For example, the Examiner alleges that a PHY control module 1302 of Agazzi "features the autonegotiation module...and the PHY control module performs the claimed diagnostics." (See Page 3, Lines 8-14 of the FINAL Office Action). Appellant respectfully disagrees because the PHY control module 1302, which the Examiner alleges "features the autonegotiation module," **is not an autonegotiation controller and does not "feature," or include, an autonegotiation controller**. Appellant respectfully notes that FIG. 13 of Agazzi clearly discloses a separate autonegotiation module 1310. As such, the Examiner's position that the PHY control module 1302 is **an autonegotiation controller** that includes a cable detector is improper. The Examiner fails to provide any evidence in support of the allegation that the PHY control module 1302 is, or includes, an autonegotiation controller as claim 1 recites.

Appellant further notes that the Examiner's position that the PHY control module 1302 "performs the claimed diagnostics" is unsupported. The Examiner relies on Column 17, Lines 17-33 of Agazzi, which state that the PHY control module 1302 may be "placed in diagnostics mode." This cited portion fails to disclose that PHY control module 1302, specifically, includes a cable detector. Instead, the Examiner relies on

Column 19, Lines 25-39, and Column 20, Lines 12-28 of Agazzi to disclose alleged cable detection. Appellant respectfully notes that neither these nor any other cited portions of Agazzi disclose that the PHY control module 1302 specifically includes the cable detector that performs these functions as claim 25 recites. Appellant further notes that Agazzi fails to disclose that the actual autonegotiation module 1310 includes a cable detector and/or performs cable detection functions, and that the Examiner fails to provide any evidence in support of such a structure in Agazzi.

Appellant further submits that locating the cable detector on the autonegotiation controller is a meaningful distinction over the structure of the prior art. In the present application, the structure of the autonegotiation controller, which includes the cable detector, associates autonegotiation with cable detection. Consequently, an operating speed determined during autonegotiation may be influenced by the number of operable twisted pair wires that are detected.

Appellant respectfully submits that Agazzi fails to show, teach, or suggest an autonegotiation controller that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable. The alleged PHY control module of Agazzi is not an autonegotiation controller, and does not include a cable detector. As such, Appellant respectfully submits that claim 25, as well as its dependent claims, should be allowable for at least the above reasons. Independent claim 174, as well as its dependent claims, should be allowable for at least similar reasons.

With respect to claims 25, 156, 165, and 174 and as shown in an exemplary embodiment in FIG. 4 of the present application, the autonegotiation controller 52 includes a speed adjuster 64. When the cable detector 60 determines that the number of operable pairs of twisted pair wires is insufficient to support an advertised speed of the device, the speed adjuster 64 "alters the autonegotiation speed" that is advertised to other devices. (Please see Paragraph [0029] of the present application). For example, as described in an exemplary embodiment in Paragraph [0031] of the present application, the speed adjuster 4 "masks" speed capabilities of the device.

The Examiner acknowledges that Agazzi is absent of any teaching or suggestion of this structure and instead relies on Trans to disclose the speed adjuster. Appellant respectfully notes that Trans still fails to make up for the deficiencies of Agazzi. For

example, the Examiner alleges that Column 21, Lines 6-41 of Trans disclose this limitation, which state:

> The Com2000™ 10/100/1000/2000Base-T Ethernet application CAT5 UTP cable requires 2 pairs of twisted wire. One pair is used for transmitting while the other pair is used for receiving. Each pair of wires is twisted together, and each twist is 90 degrees relative to the other wire in the pair. Any EMI and RFI is therefore received 90 degrees out of phase; this theoretically cancels out the EMI and RFI noise while leaving a clean network signal. In reality, although the twisted nature of the cable reduces some of the noise, the wire between twists acts as an antenna and does receive noise. This noise reception results in the 100-meter cable limit and contributes to the degradation of the transmitted signal. The RJ45 jack is utilized for Ethernet UTP applications and is an eight-pin connector. In present Com2000™ 10/100/1000/2000Base-T network system applications only four pins are actually used, Transmit Data +,- and Receive Data +,-. For Gigabit applications, all eight pins will be utilized with each of the 4 wire pairs targeted to transmit 250 Mbps in a dual duplex mode per the 802.3ab standard and 500 Mbps per 802.3ab+.
>
> The transceivers of the Com2000™ 10/100/1000/2000Base-T network interface send and receive the data utilizing differential drivers and receivers. The receiver measures the voltage difference between the conductors of Transmit Data+and Transmit Data-inputs. It is important that both twisted pair cables travel the same path and not include large cable loops within the cable path since large cable loops are susceptible to magnetic pickup, generating additional noise as well as increasing the cable propagation delay.
>
> The Com2000™ Channel Capacity Measurement and Calibration Technology compensates for the specific cable parameters that induce additional noise or cause signal degradation and attenuation. These technologies enable the operation of Gigabit and Multi-Gigabit data transmission across the CAT 5 cable medium.

Appellant respectfully notes that the above cited portion of Trans **is absent of any teaching or suggestion of a speed adjuster that masks an advertised speed of a first device based on a determination of a cable detector**. This cited portion appears to be generally related to communication over twisted pair wires and fails to even mention a speed adjuster that masks an advertised speed, much less one that masks an advertised speed when a cable detector detects a certain number of available twisted pair wires.

As such, Appellant respectfully submits that claim 25, as well as its dependent claims, should be allowable for at least the above reasons. Independent claims 156,

165, and 174, as well as their corresponding dependent claims, should be allowable for at least similar reasons.

4. Dependent Claims 26-33, 157-164, 166-173, and 175-182

With regard to claims 26-33, 157-164, 166-173, and 175-182, these claims are allowable for at least the reasons previously presented with regard to claims 25, 156, 165, and 174, respectively. Accordingly, it is respectfully requested that the rejection of these claims be overturned.

CONCLUSION

Appellant respectfully request the Honorable Board of Patent Appeals and Interferences to reverse the Examiner's rejection of each of pending claims 1-131, 134-137, 140, 141, and 156-182. Appellant respectfully submits that the prior art does not teach or suggest one or more limitations of the claims as discussed above. Accordingly, for at least the aforementioned reasons, Appellant respectfully requests the Honorable members of the Board of Patent Appeals and Interferences to reverse the outstanding rejections in connection with the present application and permit each of claims 1-131, 134-137, 140, 141, and 156-182 to be passed to allowance in connection with the present application.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Damian M. Aquino, Reg. No. 54,964, at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

This is a complete and current listing of the claims involved with the present appeal.

1. (Original) A physical layer of a first device that is connected to cable of an Ethernet network, comprising:

a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable; and

an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable.

2. (Original) The physical layer of claim 1 wherein said cable includes at least one of two pairs of twisted pair wires and four pairs of twisted pair wires

3. (Original) The physical layer of claim 1 wherein said autonegotiation controller includes a speed adjuster that masks an advertised speed of said first device when said cable detector determines that said first number is less than the number of twisted pair wires required to support a requested speed of said first device.

4. (Original) The physical layer of claim 3 wherein said requested speed is 1 Gigabit per second and said first number is two.

5. (Original) The physical layer of claim 3 wherein said speed adjuster does not mask said advertised speed of said first device when said first number is greater than or equal to the number of twisted pair wires that are required to support said requested speed.

6. (Original) The physical layer of claim 3 wherein said speed adjuster does not mask said advertised speed of said first device when said requested speed is less than 1 gigabit per second.

7. (Original) The physical layer of claim 1 wherein a pair of twisted pair wires are inoperable if signals are not received on said pair.

8. (Original) The physical layer of claim 1 wherein a pair of twisted pair wires are inoperable if signals received by said pair cannot be decoded correctly by said DSP.

9. (Original) The physical layer of claim 3 wherein said speed adjuster increments a first counter when said cable detector determines that said first number is equal to two and autonegotiation fails.

10. (Original) The physical layer of claim 9 wherein said speed adjuster resets and sets said first counter equal to zero when said first counter is equal to a first limit.

11. (Original) The physical layer of claim 1 wherein said cable detector includes a maxwait timer and has a first state.

12. (Original) The physical layer of claim 11 wherein said cable detector transitions from said first state to a second state when said DSP receives signals on at least one of a first pair and a second pair of twisted pair wires.

13. (Original) The physical layer of claim 12 wherein said cable detector transitions from said second state to a third state when said DSP receives and decodes signals on said first and second pairs of twisted pair wires.

14. (Previously Presented) The physical layer of claim 13 wherein said cable detector transitions from said second state to a fourth state when said DSP

receives signals on at least one of said first and second pairs but not on a third pair and a fourth pair of twisted pair wires and said maxwait timer times out.

15. (Original) The physical layer of claim 14 wherein said cable detector transitions from said third state to said fourth state when said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs and said maxwait timer times out.

16. (Original) The physical layer of claim 15 wherein said cable detector includes a slave counter that is incremented each time said cable detector transitions to said fourth state.

17. (Original) The physical layer of claim 16 wherein said cable detector returns to said first state when said slave counter is less than slimit and said cable detector sets said first number equal to two when said slave counter equals slimit.

18. (Original) The physical layer of claim 17 wherein said cable detector transitions from said first state to a fifth state when said maxwait timer times out and said DSP fails to detect signals on said first pair and said second pair.

19. (Original) The physical layer of claim 18 wherein said cable detector includes a master counter that is incremented each time that said cable detector transitions to said fifth state.

20. (Original) The physical layer of claim 19 wherein said cable detector returns to said first state when said master counter is less than mlimit and said cable detector sets said first number equal to two when said master counter equals mlimit.

21. (Original) The physical layer of claim 20 wherein said cable detector sets said first number equal to four when said DSP receives and decodes signals on said first, second, third and fourth pairs.

22. (Original) The physical layer of claim 21 wherein said cable detector transitions from said second state to a sixth state when said maxwait timer times out, said DSP does not receive and decode signals on said first and second pairs of twisted pair wires, and said DSP does not receive signals on at least one of said first and second pairs but not said third and fourth pairs.

23. (Original) The physical layer of claim 22 wherein said cable detector transitions from said third state to a sixth state when said maxwait timer times out and said DSP does not receive and decode signals on said first, second, third and fourth pairs.

24. (Original) The physical layer of claim 23 further comprising a status indicator that notifies said first network device when said requested speed is being masked.

25. (Original) A physical layer of a first device that is connected to cable of an Ethernet network, comprising:

cable including at least two pairs of twisted pair wires;

a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable; and

an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable and a speed adjuster that masks an advertised speed of said first device when said cable detector determines that said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device.

26. (Original) The physical layer of claim 25 wherein said speed adjuster does not mask said advertised speed of said first device when said first number is four.

27. (Original) The physical layer of claim 25 wherein said speed adjuster does not mask said advertised speed of said first device when said requested speed is less than 1 gigabit per second.

28. (Original) The physical layer of claim 25 wherein a pair of twisted pair wires are inoperable when at least one of signals are not received on said pair and signals received by said pair cannot be decoded correctly by said DSP.

29. (Original) The physical layer of claim 25 wherein said cable detector includes a maxwait timer.

30. (Original) The physical layer of claim 29 wherein said cable detector increments a slave counter when said maxwait timer times out and said DSP receives signals on first and second pairs of twisted pair wires but does not receive signals on third and fourth pairs of twisted pair wires

31. (Original) The physical layer of claim 30 wherein said cable detector increments said slave counter when said maxwait timer times out and said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs of twisted pair wires.

32. (Original) The physical layer of claim 31 wherein said cable detector sets said first number equal to two when said slave counter is equal to slimit.

33. (Original) The physical layer of claim 32 further comprising a status indicator that notifies said first network device when said first speed is being masked.

34. (Original) A method for operating a physical layer of a first device that is connected to cable of an Ethernet network, comprising:

coupling a digital signal processor (DSP) to said cable;

receiving and decoding first signals on said cable;
coding and transmitting second signals on said cable;

communicating with said DSP using an autonegotiation controller; and

detecting a first number of pairs of twisted pair wires of said cable that are operable with a cable detector associated with said autonegotiation controller.

35. (Original) The method of claim 34 wherein said cable includes at least one of two pairs of twisted pair wires and four pairs of twisted pair wires

36. (Original) The method of claim 34 further comprising masking an advertised speed of said first device using a speed adjuster when said cable detector determines that said first number is less than a number of twisted pair wires required to support a requested speed of said first device.

37. (Original) The method of claim 36 wherein said requested speed is 1 Gigabit per second and said first number is two.

38. (Original) The method of claim 36 wherein said speed adjuster does not mask said advertised speed of said first device when said first number is four.

39. (Original) The method of claim 36 wherein said speed adjuster does not mask said advertised speed of said first device when said requested speed is less than 1 gigabit per second.

40. (Original) The method of claim 34 further comprising determining that a pair of twisted pair wires are inoperable if signals are not received on said pair.

41. (Original) The method of claim 35 further comprising determining that a pair of twisted pair wires are inoperable if signals received by said pair cannot be decoded correctly by said DSP.

42. (Original) The method of claim 36 further comprising incrementing a first counter using said speed adjuster when said cable detector determines that said first number is equal to two and autonegotiation fails.

43. (Original) The method of claim 42 further comprising setting said first counter equal to zero using said speed adjuster when said first counter is equal to a first limit.

44. (Original) The method of claim 34 wherein said cable detector includes a maxwait timer and has a first state.

45. (Original) The method of claim 44 further comprising transitioning from said first state to a second state of said cable detector when said DSP receives signals on at least one of a first pair and a second pair of twisted pair wires.

46. (Original) The method of claim 45 further comprising transitioning from said second state to a third state of said cable detector when said DSP receives and decodes signals on said first and second pairs of twisted pair wires.

47. (Previously Presented) The method of claim 46 further comprising transitioning from said second state to a fourth state of said cable detector when said DSP receives signals on at least one of said first and second pairs but not on a third pair and a fourth pair of twisted pair wires and said maxwait timer times out.

48. (Original) The method of claim 47 further comprising transitioning from said third state to said fourth state when said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs and said maxwait timer times out.

49. (Original) The method of claim 48 wherein said cable detector includes a slave counter and further comprising incrementing said slave counter each time that said cable detector transitions to said fourth state.

50. (Original) The method of claim 49 further comprising:

returning to said first state when said slave counter is less than slimit; and

setting said first number equal to two when said slave counter equals slimit.

51. (Original) The method of claim 50 further comprising transitioning from said first state to a fifth state of said cable detector when said maxwait timer times out and said DSP fails to detect signals on said first pair and said second pair.

52. (Original) The method of claim 51 wherein said cable detector includes a master counter that is incremented each time that said cable detector transitions to said fifth state.

53. (Original) The method of claim 52 further comprising:

returning to said first state when said master counter is less than mlimit; and

setting said first number equal to two when said master counter equals mlimit.

54. (Original) The method of claim 53 wherein said cable detector sets said first number equal to four when said DSP receives and decodes signals on said first, second, third and fourth pairs.

55. (Original) The method of claim 54 further comprising transitioning from said second state to a sixth state of said cable detector when said maxwait timer times out and said DSP does not receive and decode signals on said first and second pairs of twisted pair wires.

56. (Original) The method of claim 55 further comprising transitioning from said third state to a sixth state of said cable detector when said maxwait timer times out and said DSP does not receive and decode signals on said first, second, third and fourth pairs.

57. (Original) The method of claim 56 further comprising generating a status indicator that notifies said first network device when said requested speed is being masked.

58. (Original) A physical layer of a first device that is connected to cable of an Ethernet network, comprising:

signal processing means coupled to said cable for receiving and decoding first signals on said cable and for coding and transmitting second signals on said cable; and

autonegotiation means for communicating with said signal processing means and including cable detector means for determining a first number of pairs of twisted pair wires of said cable that are operable.

59. (Original) The physical layer of claim 58 wherein said cable includes at least one of two pairs of twisted pair wires and four pairs of twisted pair wires

60. (Original) The physical layer of claim 58 wherein said autonegotiation means includes speed adjustment means for masking an advertised speed of at least one of said first and second devices when said cable detector means determines that said first number is less than the number of twisted pair wires required for a requested speed of said first device.

61. (Original) The physical layer of claim 60 wherein said requested speed is 1 Gigabit per second and said first number is two.

62. (Original) The physical layer of claim 60 wherein said speed adjustment means does not mask said advertised speed of said first device when said first number is four.

63. (Original) The physical layer of claim 60 wherein said speed adjustment means does not mask said advertised speed of said first device when said requested speed is less than said first speed.

64. (Original) The physical layer of claim 58 wherein a pair of twisted pair wires are inoperable if signals are not received on said pair.

65. (Original) The physical layer of claim 58 wherein a pair of twisted pair wires are inoperable if signals received by said pair cannot be decoded correctly by said signal processing means.

66. (Original) The physical layer of claim 60 wherein said speed adjuster increments a first counter when said cable detector means determines that said first number is equal to two and autonegotiation fails.

67. (Original) The physical layer of claim 66 wherein said speed adjustment means resets and sets said first counter equal to zero when said first counter is equal to a first limit.

68. (Original) The physical layer of claim 58 wherein said cable detector means includes a maxwait timer and has a first state.

69. (Original) The physical layer of claim 68 wherein said cable detector means transitions from said first state to a second state when said signal processing means receives signals on at least one of a first pair and a second pair of twisted pair wires.

70. (Original) The physical layer of claim 69 wherein said cable detector means transitions from said second state to a third state when said signal processing means receives and decodes signals on said first and second pairs of twisted pair wires.

71. (Previously Presented) The physical layer of claim 70 wherein said cable detector means transitions from said second state to a fourth state when said signal processing means receives signals on at least one of said first and second pairs but not on a third pair and a fourth pair of twisted pair wires and said maxwait timer times out.

72. (Original) The physical layer of claim 71 wherein said cable detector means transitions from said third state to said fourth state when said signal processing means receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs and said maxwait timer times out.

73. (Original) The physical layer of claim 72 wherein said cable detector means includes a slave counter that is incremented each time said cable detector means transitions to said fourth state.

74. (Original) The physical layer of claim 73 wherein said cable detector means returns to said first state when said slave counter is less than slimit and said cable detector means sets said first number equal to two when said slave counter equals slimit.

75. (Original) The physical layer of claim 74 wherein said cable detector means transitions from said first state to a fifth state when said maxwait timer times out and said signal processing means fails to detect signals on said first pair and said second pair.

76. (Original) The physical layer of claim 75 wherein said cable detector means includes a master counter that is incremented each time that said cable detector means transitions to said fifth state.

77. (Original) The physical layer of claim 76 wherein said cable detector means returns to said first state when said master counter is less than mlimit and said cable detector means sets said first number equal to two when said master counter equals mlimit.

78. (Original) The physical layer of claim 77 wherein said cable detector means sets said first number equal to four when said signal processing means receives and decodes signals on said first, second, third and fourth pairs.

79. (Original) The physical layer of claim 78 wherein said cable detector means transitions from said second state to a sixth state when said maxwait timer times out and said signal processing means does not receive and decode signals on said first and second pairs of twisted pair wires.

80. (Original) The physical layer of claim 79 wherein said cable detector means transitions from said third state to a sixth state when said maxwait timer times out and said signal processing means does not receive and decode signals on said first, second, third and fourth pairs.

81. (Original) The physical layer of claim 80 further comprising status indicating means for notifying said first network device when said first speed is being masked.

82. (Original) An Ethernet network, comprising:

a first network device with a first physical layer including a first digital signal processor (DSP) coupled to cable that receives and decodes first signals on said cable and that codes and transmits second signals on said cable, and a first

autonegotiation controller that communicates with said first DSP and that includes a first cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable; and

a second network device with a second physical layer including a second DSP coupled to said cable that receives and decodes said second signals on said cable and that codes and transmits said first signals on said cable.

83. (Original) The Ethernet network of claim 82 wherein said second network device includes a second autonegotiation controller that communicates with said second DSP and that includes a second cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable.

84. (Original) The Ethernet network of claim 82 wherein said cable includes at least one of two pairs of twisted pair wires and four pairs of twisted pair wires

85. (Original) The Ethernet network of claim 82 wherein said first autonegotiation controller includes a first speed adjuster that masks an advertised speed of said first device when said first cable detector determines that said first number is equal to two and when a first speed is requested by said first device.

86. (Original) The Ethernet network of claim 85 wherein said first speed is 1 Gigabit per second.

87. (Original) The Ethernet network of claim 85 wherein said first speed adjuster does not mask said advertised speed of said first device when said first number is four.

88. (Original) The Ethernet network of claim 85 wherein said first speed adjuster does not mask said advertised speed of said first device when said requested speed is less than said first speed.

89. (Original) The Ethernet network of claim 83 wherein a pair of twisted pair wires are inoperable if signals are not received on said pair.

90. (Original) The Ethernet network of claim 83 wherein a pair of twisted pair wires are inoperable if signals received by said pair cannot be decoded correctly by said first DSP.

91. (Original) The Ethernet network of claim 85 wherein said first speed adjuster increments a first counter when said first cable detector determines that said first number is equal to two and autonegotiation fails.

92. (Original) The Ethernet network of claim 91 wherein said first speed adjuster resets and sets said first counter equal to zero when said first counter is equal to a first limit.

93. (Original) The Ethernet network of claim 83 wherein said first cable detector includes a maxwait timer and has a first state.

94. (Original) The Ethernet network of claim 93 wherein said first cable detector transitions from said first state to a second state when said first DSP receives signals on at least one of a first pair and a second pair of twisted pair wires.

95. (Original) The Ethernet network of claim 94 wherein said first cable detector transitions from said second state to a third state when said first DSP receives and decodes signals on said first and second pairs of twisted pair wires.

96. (Previously Presented) The Ethernet network of claim 95 wherein said first cable detector transitions from said second state to a fourth state when said first DSP receives signals on at least one of said first and second pairs but not on a third pair and a fourth pair of twisted pair wires and said maxwait timer times out.

97. (Original) The Ethernet network of claim 96 wherein said first cable detector transitions from said third state to said fourth state when said first DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs and said maxwait timer times out.

98. (Original) The Ethernet network of claim 97 wherein said first cable detector includes a slave counter that is incremented each time said first cable detector transitions to said fourth state.

99. (Original) The Ethernet network of claim 98 wherein said first cable detector returns to said first state when said slave counter is less than slimit and said first cable detector sets said first number equal to two when said slave counter equals slimit.

100. (Original) The Ethernet network of claim 99 wherein said first cable detector transitions from said first state to a fifth state when said maxwait timer times out and said first DSP fails to detect signals on said first pair and said second pair.

101. (Original) The Ethernet network of claim 100 wherein said first cable detector includes a master counter that is incremented each time that said first cable detector transitions to said fifth state.

102. (Original) The Ethernet network of claim 101 wherein said first cable detector returns to said first state when said master counter is less than mlimit and said cable detector sets said first number equal to two when said master counter equals mlimit.

103. (Original) The Ethernet network of claim 102 wherein said first cable detector sets said first number equal to four when said first DSP receives and decodes signals on said first, second, third and fourth pairs.

104. (Original) The Ethernet network of claim 103 wherein said first cable detector transitions from said second state to a sixth state when said maxwait timer times out and said first DSP does not receive and decode signals on said first and second pairs of twisted pair wires.

105. (Original) The Ethernet network of claim 104 wherein said first cable detector transitions from said third state to a sixth state when said maxwait timer times out and said first DSP does not receive and decode signals on said first, second, third and fourth pairs.

106. (Original) The Ethernet network of claim 105 further comprising a status indicator that notifies said first network device when said first speed is being masked.

107. (Original) A network device that is connected to cable of an Ethernet network, comprising:

a physical layer including:

a digital signal processor (DSP) coupled to said cable that receives and decodes first signals on said cable and that codes and transmits second signals to said second device on said cable; and

an autonegotiation controller that communicates with said DSP and that includes a cable detector that determines a first number of pairs of twisted pair wires of said cable that are operable.

108. (Original) The network device of claim 107 wherein said first signals are transmitted by a second network device.

109. (Original) The network device of claim 107 wherein said cable includes at least one of two pairs of twisted pair wires and four pairs of twisted pair wires

110. (Original) The network device of claim 107 wherein said autonegotiation controller includes a speed adjuster that masks an advertised speed of said first network device when said cable detector determines that said first number is equal to two and that a first speed is requested by said first network device.

111. (Original) The network device of claim 110 wherein said first speed is 1 Gigabit per second.

112. (Original) The network device of claim 110 wherein said speed adjuster does not mask said advertised speed of said first network device when said first number is four.

113. (Original) The network device of claim 110 wherein said speed adjuster does not mask said advertised speed of said first network device when said requested speeds are less than said first speed.

114. (Original) The network device of claim 109 wherein a pair of twisted pair wires are inoperable if signals are not received on said pair.

115. (Original) The network device of claim 109 wherein a pair of twisted pair wires are inoperable if signals received by said pair cannot be decoded correctly by said DSP.

116. (Original) The network device of claim 110 wherein said speed adjuster increments a first counter when said cable detector determines that said first number is equal to two and autonegotiation fails.

117. (Original) The network device of claim 116 wherein said speed adjuster resets and sets said first counter equal to zero when said first counter is equal to a first limit.

118. (Original) The network device of claim 117 wherein said cable detector includes a maxwait timer and has a first state.

119. (Original) The network device of claim 118 wherein said cable detector transitions from said first state to a second state when said DSP receives signals on at least one of a first pair and a second pair of twisted pair wires.

120. (Original) The network device of claim 119 wherein said cable detector transitions from said second state to a third state when said DSP receives and decodes signals on said first and second pairs of twisted pair wires.

121. (Previously Presented) The network device of claim 120 wherein said cable detector transitions from said second state to a fourth state when said DSP receives signals on at least one of said first and second pairs but not on a third pair and a fourth pair of twisted pair wires and said maxwait timer times out.

122. (Original) The network device of claim 121 wherein said cable detector transitions from said third state to said fourth state when said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs and said maxwait timer times out.

123. (Original) The network device of claim 122 wherein said cable detector includes a slave counter that is incremented each time said cable detector transitions to said fourth state.

124. (Original) The network device of claim 123 wherein said cable detector returns to said first state when said slave counter is less than slimit and said cable detector sets said first number equal to two when said slave counter equals slimit.

125. (Original) The network device of claim 124 wherein said cable detector transitions from said first state to a fifth state when said maxwait timer times out and said DSP fails to detect signals on said first pair and said second pair.

126. (Original) The network device of claim 125 wherein said cable detector includes a master counter that is incremented each time that said cable detector transitions to said fifth state.

127. (Original) The network device of claim 126 wherein said cable detector returns to said first state when said master counter is less than mlimit and said cable detector sets said first number equal to two when said master counter equals mlimit.

128. (Original) The network device of claim 127 wherein said cable detector sets said first number equal to four when said DSP receives and decodes signals on said first, second, third and fourth pairs.

129. (Original) The network device of claim 128 wherein said cable detector transitions from said second state to a sixth state when said maxwait timer times out and said DSP does not receive and decode signals on said first and second pairs of twisted pair wires.

130. (Original) The network device of claim 129 wherein said cable detector transitions from said third state to a sixth state when said maxwait timer times out and said DSP does not receive and decode signals on said first, second, third and fourth pairs.

131. (Original) The network device of claim 130 further comprising a status indicator that notifies said first network device when said first speed is being masked.

156. (Original) A method for operating a physical layer of a first device that is connected to cable of an Ethernet network, comprising:

coupling said cable to a digital signal processor (DSP);

receiving and decoding first signals on said cable using said DSP;

coding and transmitting second signals on said cable using said DSP;

determining a first number of pairs of twisted pair wires of said cable that are operable; and

masking an advertised speed of said first device when said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device.

157. (Original) The method of claim 156 wherein said advertised speed of said first device is not masked when said first number is four.

158. (Original) The method of claim 156 wherein said advertised speed of said first device is not masked when said requested speed is less than 1 gigabit per second.

159. (Original) The method of claim 156 further comprising determining that a pair of twisted pair wires are inoperable when at least one of signals are not received on said pair and signals received by said pair cannot be decoded correctly by said DSP.

160. (Original) The method of claim 156 further comprising starting a maxwait timer.

161. (Original) The method of claim 160 further comprising incrementing a slave counter when said maxwait timer times out and said DSP receives signals on first and second pairs of twisted pair wires but does not receive signals on third and fourth pairs of twisted pair wires

162. (Original) The method of claim 161 further comprising incrementing said slave counter when said maxwait timer times out and said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs of twisted pair wires.

163. (Original) The method of claim 162 further comprising setting said first number equal to two when said slave counter is equal to slimit.

164. (Original) The method of claim 163 further comprising generating a status signal that notifies said first network device when said first speed is being masked.

165. (Original) A software method for operating a physical layer of a first device that is connected to cable of an Ethernet network, comprising:

coupling said cable to a digital signal processor (DSP);

receiving and decoding first signals on said cable using said DSP;

coding and transmitting second signals on said cable using said DSP;

determining a first number of pairs of twisted pair wires of said cable that are operable; and

masking an advertised speed of said first device when said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device.

166. (Original) The software method of claim 165 wherein said advertised speed of said first device is not masked when said first number is four.

167. (Original) The software method of claim 165 wherein said advertised speed of said first device is not masked when said requested speed is less than 1 gigabit per second.

168. (Original) The software method of claim 165 further comprising determining that a pair of twisted pair wires are inoperable when at least one of signals are not received on said pair and signals received by said pair cannot be decoded correctly by said DSP.

169. (Original) The software method of claim 165 further comprising starting a maxwait timer.

170. (Original) The software method of claim 169 further comprising incrementing a slave counter when said maxwait timer times out and said DSP receives signals on first and second pairs of twisted pair wires but does not receive signals on third and fourth pairs of twisted pair wires

171. (Original) The software method of claim 170 further comprising incrementing said slave counter when said maxwait timer times out and said DSP receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs of twisted pair wires.

172. (Original) The software method of claim 171 further comprising setting said first number equal to two when said slave counter is equal to slimit.

173. (Original) The software method of claim 172 further comprising generating a status signal that notifies said first network device when said first speed is being masked.

174. (Original) A physical layer of a first device that is connected to cable of an Ethernet network, comprising:

signal processing means coupled to said cable for receiving and decoding first signals on said cable and for coding and transmitting second signals on said cable; and

autonegotiation control means for communicating with said signal processing means and including cable detection means for determining a first number of pairs of twisted pair wires of said cable that are operable and speed adjusting means for masking an advertised speed of said first device when said cable detection means determines that said first number is less than a number of twisted pair wires that are required to support a requested speed of said first device.

175. (Original) The physical layer of claim 174 wherein said speed adjusting means does not mask said advertised speed of said first device when said first number is four.

176. (Original) The physical layer of claim 174 wherein said speed adjusting means does not mask said advertised speed of said first device when said requested speed is less than 1 gigabit per second.

177. (Original) The physical layer of claim 174 wherein a pair of twisted pair wires are inoperable when at least one of signals are not received on said pair and signals received by said pair cannot be decoded correctly by said signal processing means.

178. (Original) The physical layer of claim 174 wherein said cable detection means includes a maxwait timer.

179. (Original) The physical layer of claim 178 wherein said cable detection means increments a slave counter when said maxwait timer times out and said signal processing means receives signals on first and second pairs of twisted pair wires but does not receive signals on third and fourth pairs of twisted pair wires

180. (Original) The physical layer of claim 179 wherein said cable detection means increments said slave counter when said maxwait timer times out and said signal processing means receives and decodes signals on said first and second pairs but does not receive signals on said third and fourth pairs of twisted pair wires.

181. (Original) The physical layer of claim 180 wherein said cable detection means sets said first number equal to two when said slave counter is equal to slimit.

182. (Original) The physical layer of claim 181 further comprising status indicating means for notifying said first network device when said first speed is being masked.

IX. EVIDENCE APPENDIX

A copy of the Office Action mailed June 14, 2007 is attached.

X. RELATED PROCEEDINGS APPENDIX

There are no related proceedings.